

10. The recognizer of Claim 9 wherein said signal source representation and said set of transformations are determined by applying linear equations 21 and 22 as follows:

$$\sum_{e \in \Omega_e} E_{jke} b_{ke} + F_{jk} \mu_{jk} = a_{jk} \quad \forall j \in \Omega_j, \quad (21)$$

$$G_{ke} b_{ke} + \sum_{j \in \Omega_j} H_{jke} \mu_{jk} = c_{ke} \quad \forall e \in \Omega_e \quad (22)$$

and solve jointly for mean vectors and bias vectors and at the same time calculate the variance using equation 23 as follows:

$$\sum_{jk} = \frac{\sum_{e \in \Omega_e} \sum_{r=1}^R \sum_{t=1}^T \gamma_t^r(j, k, e) \delta_t^r(j, k, e) \delta_t^r(j, e, k)}{\sum_{e \in \Omega_e} g(j, k, e)} \quad (23)$$

where $\delta_t^r(j, k, e) \triangleq o_t^r - W_{je} \mu_{jk} - b_{ke}$

and using equation 24 as follows:

$$Z_{je}^{(m)} = W_{je}^{(m)} R_{je}^{(m)} \quad (24)$$

to solve for transformation parameters using equations 25 and 26 as follows :

$$Z_{je}^{(m,n)} \triangleq \sum_{k \in \Omega_k} \sum_{jk}^{-1(m,n)} \mu_{jk}^{(n)} \sum_{r=1}^R \sum_{t=1}^T \gamma_t^r(j, k, e) (o_t^r - b_{ke})^{(m)} \quad (25)$$

$$R_{je}^{(p,n)}(m) \triangleq \sum_{k \in \Omega_k} \sum_{jk}^{-1(m,n)} \mu_{jk}^{(p)} \mu_{jk}^{(n)} \sum_{r=1}^R \sum_{t=1}^T \gamma_t^r(j, k, e). \quad (26)$$